

screen. The multi-function mode may be selected in a variety of ways. In one implementation, when the user simultaneously touches two or more device icons, the device activates the multiple device functionalities and brings the appropriate GUIs into view on the screen.

D. Configurable GUI (User Preferences)

[0093] The GUI control panels for each device functionality may be configurable by the user. For example, the user may design or customize his own UI for each device, and assign functions to the various elements of the UI. The functions may include initiating commands, selecting an item, opening a file or document, launching a program, executing instructions, viewing a menu on the display screen, etc. The parameters configurable by the user may include selecting the number and type of GUI elements (buttons) as well as the location of the GUI elements on the page. In some cases, the system may include a design palette that allows a user to review and/or customize the UI layout, i.e., the user may quickly and conveniently review preconfigured or default layout and make changes thereto. Once changed, the modified layout will be automatically saved and thereby employed to handle future events.

IV. Input Devices

[0094] There are a number of problems with current input devices for hand-held computers. For example, there is no realistic way to fit all the dedicated physical buttons that are needed for each device because more and more buttons must be fit into a small space. A related problem arises in that as more physical buttons are incorporated into the device, the buttons must get closer together thereby challenging the dexterity of the user. Furthermore, because physical buttons stick out they are often accidentally activated during normal use or while the device is transported e.g., in a user's pocket. Finally, large numbers of small physical buttons can be confusing to the user as well as aesthetically unpleasing.

[0095] To overcome these and other problems a variety of alternative inputs arrangements are proposed (in addition to or in place of physical buttons, switches, etc.). The basic idea is to reduce the number of physical and mechanical input mechanisms (and therefore the amount of dedicated space needed on the surface of the device) and/or eliminate the physical and mechanical input mechanisms altogether. By reducing or eliminating the physical input devices, the display of the electronic device can be maximized, or alternatively the size of the electronic device can be minimized. Furthermore, such a device is more aesthetically pleasing. In some cases, the hand-held device can be configured so that it appears to only have a display and no dedicated physical input devices.

[0096] The alternative input means may also be hidden from view such that they are not visible to the user. As a result, the hand-held electronic device may appear to only have a display with no visible buttons, switches, etc. Such a device is more aesthetically pleasing (e.g., may comprise smooth surfaces with no breaks gaps or lines), and, in many cases, can be made smaller without sacrificing screen size and input functionality.

A. Touch Screen

[0097] One particularly suitable input arrangement is a touch screen. A touch screen in conjunction with GUI may

be configured as the primary input arrangement for a hand-held device. A touch screen is basically a transparent input panel positioned in front of the display. A touch screen generates input signals when an object such as a finger or stylus touches or is moved across the surface of the touch screen. In most cases, touch screens allow a user to make selections and initiate movements in a GUI by simply touching the display screen via a finger. For example, a user may make a selection by pointing directly to a graphical object displayed on the display screen. Corresponding to an on-screen button for performing specific actions in the hand-held electronic device. In general, the touch screen recognizes the touch and position of the touch on the display and a controller of the hand-held electronic device interprets the touch and thereafter performs an action based on the touch event. There are several types of touch screen technologies including resistive, capacitive, infrared and surface acoustic wave.

[0098] A preferred touch screen for a multi-functional hand-held computer is a multipoint capacitive touch screen. Such a touch screen comprises several independent and spatially distinct sensing points, nodes, or regions that are positioned throughout the touch screen. The sensing points are dispersed about the touch screen with each sensing point representing a different position on the surface of the touch screen. The sensing points may be positioned in a grid or a pixel array where each sensing point is capable of generating a signal. A signal is produced each time an object is positioned over a sensing point. When an object is placed over multiple sensing points or when the object is moved between or over multiple sensing point, multiple signals can be generated. The sensing points generally map the touch screen plane into a coordinate system such as a Cartesian coordinate system or polar coordinate system. One example of such a touch screen is disclosed in U.S. patent application Ser. No. 10/840,862, titled "Multipoint Touch Screen" filed on May 6, 2004.

B. Touch Sensitive Housing

[0099] A hand-held electronic device may also incorporate one or more include a touch sensitive surfaces of the device housing itself that provide either a larger surface for tracking touch inputs or smaller dedicated areas such as touch buttons for performing dedicated functions. Such surfaces may be located on any surface of the housing, any side of the housing, any portion of any side of the housing or at dedicated locations on the surface of the housing. For example, the touch regions may be located on the sides or back surface of the housing, and may even be located at the bezel located at the front surface of the housing. In all of these cases, a large portion of the front surface of the housing is saved for the display so that the viewing area of the hand-held electronic device can be maximized. The touch sensitive surfaces of the housing may take the form of one or more touch panels that are positioned within the housing. The touch sensitive surface may be alternatively or additionally be provided directly by the housing. That is, the touch sensing components may be integrated or incorporated into or disposed underneath the housing such that the housing itself is the touch sensing device (rather than using a separate touch panel). Similarly to a touch screen, a touch sensitive housing recognizes the touch and position of a touch on the surface and a controller of the hand-held electronic device interprets the touch and thereafter per-